

# Modeling Commercial Building PV Requirements

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**CED 2021**



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# Modeling Commercial PV Requirements

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- CEC adopted new commercial PV requirements in Aug 2021
  - Go into effect Jan 2023
  - PV requirements apply based on climate zone, commercial building type, and floor area
    - With certain exceptions.
- Will reintroduce Additional Achievable PV (AAPV) to PV forecast.
  - Last used AAPV in 2019 PV forecast to account for residential PV requirements
- CEC's commercial sector predictive model does not differentiate PV adoption between new and existing buildings.



# Approach

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- Method to account for commercial PV requirements

**STEP 1** – Run predictive commercial model

- Using CEC's commercial floorspace forecast

**STEP 2** – Run predictive commercial model w/ modified floorspace forecast

- Remove floorspace additions affected by new PV requirements

**STEP 3** – Estimate PV Adoption in new commercial buildings (floorspace) based on new PV requirements

**STEP 4** – Calculate AAPV:

$$[(\text{Step 2} + \text{Step 3}) - \text{Step 1}] = \text{AAPV}$$

- How do we calculate Step 3?

- Start with calculating commercial floorspace additions affected by new PV requirements



# PV Req. for Commercial Buildings

$$PV \text{ size } (kW_{dc}) = \min \left( \frac{CFA \times A}{1000}, \frac{SARA \times (14 \text{ W/ft}^2)}{1000} \right)$$

PV requirement  
based on floor area

PV requirement  
based on roof area

CFA = Conditioned Floor Area

A = PV factor specified in table below (by building type and climate zone)

SARA = Solar Access Roof Area

Climate Zone	Factor A – Minimum PV Capacity (W/ft <sup>2</sup> )		
	1, 3, 5, 16	2, 4, 6-14	15
Grocery	2.62	2.91	3.53
High-Rise Multifamily	1.82	2.21	2.77
Office, Financial Institutions, Unleased Tenant Space	2.59	3.13	3.8
Retail	2.62	2.91	3.53
School	1.27	1.63	2.46
Warehouse	0.39	0.44	0.58
Auditorium, Convention Center, Hotel/Motel, Library, Medical Office Building/Clinic, Restaurant, Theater	0.39	0.44	0.58

Source: CEC, Efficiency Division (August 2020)

## Exceptions: PV not required when:

1. SARA < 3% of CFA
2. SARA < 80 contiguous sq ft
3. Exceeds snow loads
4. Required PV size < 4 kW<sub>dc</sub>
5. For multi-tenant buildings where LSE / Utility does not offer VNEM or community solar option.



# Methodology

